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“It turns out that the [health] effects of education and wealth are not as straightforward as expected.”

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TRANSITIONS TO ADULTHOOD

Reproductive Health Program for Youth Successful in Kenya

Standardized interventions rarely meet all the needs of clients in every location. Thus, Population Council investigators have long advocated using social science research findings to guide program priorities. A recent evaluation of a reproductive health program for young Kenyans provides an example of the power of this method. Program strategies were tailored to specific geographic areas based on the results of research in the local communities. Not only was the intervention acceptable, but a postintervention survey found that young people living in the project area were more likely than other young people to discuss issues of sexuality with adults and to protect themselves against HIV infection and unwanted pregnancy.

Adolescent sexual and reproductive health

In sub-Saharan Africa, most reproductive health programs for youth are limited to a small set of models, such as school-based programs, peer education, and youth centers. And there have seldom been rigorous evaluations of programs. Consequently, there are few data to shed light on whether these models are appropriate and effective for young people in different settings.

The Nyeri Youth Health Project is an intervention for young people implemented by the Family Planning Association of Kenya in collaboration with representatives from the community. The Population Council provided technical assistance for the formative research, the design of the intervention and its management information system, and the creation of the quasi-experimental design of the project, which allowed for its evaluation. The

intervention took place in Nyeri municipality between 1998 and 2000. Nyeri's population includes about 14,000 unmarried young people aged 10–24, the primary target group for the project. The control site, Nyahururu municipality, is located more than 100 kilometers from Nyeri in the same province, Central Province. The two locations are similar in ethnic and religious composition, socioeconomic status, and health and educational infrastructure. The researchers carried out cross-sectional surveys in the project and control sites before and after the intervention and considered changes in the project site that were significantly different from those in the control to be associated with the project activities.

In order to design effective reproductive health services for youth, the program managers undertook qualitative research during a year-long planning phase. First, they assessed staff attitudes about providing sexual and reproductive health information and services to young people. Next, they conducted in-depth interviews and focus group discussions among young people, their parents, and community leaders. These activities revealed that both young people and parents preferred that adults, rather than peers, deliver such information.

Among the Kikuyu, the largest ethnic group in Kenya, parents of adolescents traditionally sent their children to other parents to receive instruction on sexuality and related issues. Consistent with this practice, the Nyeri Youth Health Project enlisted respected young parents living in the community to

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Education, Wealth Play Different Roles in Health

It is axiomatic that higher levels of education and wealth correlate with better health. Much research has shown that the more educated and wealthy people are, the more likely they are to be healthy. Very few researchers, however, have investigated the relative contributions of education and wealth to various health-related processes. Population Council demographer Zachary Zimmer and University of Michigan researcher James S. House collaborated on a study of the roles played by education and wealth in the onset and progression of ill health.

Americans' Changing Lives

The researchers used data collected in 1986 and 1994 from the more than 3,500 people aged 25 years or older who responded to the Americans' Changing Lives survey. In their research, Zimmer and House focused on answers to the survey question "How much are your daily activities limited in any way by your health or health-related problems?" On the basis of their answer to this question, people were classified as having no limitations or as having mild, moderate, or severe limitations.

The respondents' education was categorized as less than high school, completed high school, or more than high school. Education is an indicator of people's social and economic status in early adulthood and of their knowledge, skills, and capacities from that time on, all of which influence long-term patterns of exposure to and experience of risk factors.

Wealth was divided into personal incomes of less than US\$10,000; \$10,000–19,999; \$20,000–39,999; or \$40,000 or more. Income reflects socioeconomic position and resources closer to the time of the identification of the health problem. Income influences not only the exposure to or experiences of risk factors for disease, but also the resources available for the treatment or management of disease.

Because the survey was conducted in both 1986 and 1994, the researchers were able to

explore the effects of education and wealth on both the onset of illness and its progression over time. They controlled for age, sex, race, and marital status, variables that can play a role in health outcomes.

Differing influences

The researchers found that education, which is typically completed by early adulthood, strongly influences when functional health problems

"The fact that education does not alter the course of an illness once it arises may give us important clues about the mechanism of the effect of education."

arise. (Functional health problems are those that influence one's ability to conduct tasks that need to be completed on a daily basis.) But schooling had little or no effect on recovery or further decline, meaning the progression of such problems is not associated with education. Income affects the onset of functional health problems, and equally affects the course of such problems, especially the chances of improvement and avoidance of further decline.

In this longitudinal study, 542 deaths were recorded over time, and the researchers also looked at survival chances. Death is differentially influenced by education and income. Both factors correlated with improved survival chances among those who were healthy at the

start of the survey. But, education had less influence on the risk of death among those who reported limitations at the start of the study.

Unexpected effects

"It is common in the fields of demography and public health to link education and wealth to health outcomes such as illness and death. But it turns out that the effects of education and wealth are not as straightforward as expected," explains Zimmer. "The fact that education does not alter the course of an illness once it arises may give us important clues about the mechanism of the effect of education." The researchers believe that education may improve health by giving people a better understanding of the nature of disease and how to avoid illness. Educated people may be more likely to exercise, eat healthily, and avoid smoking, for example. Hence, those with higher education may experience a delay or compression of illness compared to those with lower education. Illnesses that arrive later in life, however, may be severe and difficult to overcome.

Income is also important with respect to the prevention of illnesses, probably for similar reasons. High income, however, may additionally help people recover from problems once they arise. Zimmer and House suggest that this may be the result of the greater ability to treat and manage disease among those with higher income. "Higher current income," says Zimmer, "may allow people to purchase quality health care and other amenities that can assist in recovery." ■

SOURCE

Zimmer, Zachary and James S. House. 2003. "Education, income, and functional limitation transitions among American adults: Contrasting onset and progression," *International Journal of Epidemiology* 32(6): 1089–1097.

OUTSIDE FUNDING

The National Institute on Aging and the Robert Wood Johnson Foundation

Door-to-Door Delivery Enhances Women's Status in Bangladesh

From 1978 until 1997, female family welfare assistants in Bangladesh delivered contraceptives to women in their homes. This service was stopped in 1997, in part because of the arguments of observers who believed that doorstep delivery of contraceptives may prevent improvements in women's status by reinforcing the customs of patriarchy and *purdah*, or female seclusion. When doorstep delivery of contraceptives ended, women who wished to use contraception had to travel to centralized clinics to obtain it.

Enhancing or diminishing status?

Population Council demographer James F. Phillips and his Morgan State University colleague Mian Bazle Hossain questioned the qualitative research evidence cited to support this change in policy. They noted that other qualitative research had demonstrated that home services enhance the status of women over time. The delivery of contraceptives gives women control over their fertility and allows them to interact with other women, the family welfare assistants. The assistants, in turn, benefit directly by receiving cash wages and indirectly by gaining mobility, prestige, and authority from their work. Moreover, the large-scale deployment of female family planning workers changed people's perceptions of women's roles. Critics of centralized services argued that ending door-to-door delivery of contraceptives would not only put tens of thousands of female family welfare assistants out of work, but would increase the fertility of their former clients, who would be unlikely to travel to centralized clinics. Phillips and Hossain conducted a large-scale statistical analysis to determine which perspective was supported by quantitative evidence.

Criticism misplaced

Phillips and Hossain's analysis showed that criticism of home-based services on grounds

that they reinforce women's traditional roles is not supported by evidence. In fact, home services improve women's status, largely by improving the effectiveness of family planning and lowering fertility. They examined data on 3,783 rural women from two cross-sectional surveys on women's status conducted in 1988 and 1993 and longitudinal data assessing the impact of visits with family welfare assistants between 1982 and 1993. By linking data from the two surveys to the longitudinal histories of contact with family welfare assistants, the researchers created a powerful tool for examin-

Reducing unwanted fertility fosters improved mobility, autonomy, and household authority for rural women in Bangladesh.

ing the relationship between workers' contact and the change in women's status over the period from 1988 to 1993. The researchers also prepared an index, based on 19 indicators from the 1993 survey, to represent women's status. Using this index and controlling for women's status in 1988 allowed them to statistically analyze change over time and to determine the cause of that change.

Phillips and Hossain demonstrated that home delivery of family planning services improved women's status. Further statistical analysis revealed that the positive effects of out-

reach by family welfare assistants are attributable mainly to the effect of fertility regulation rather than to the effect of social interaction during the visit. These results indicate that reducing unwanted fertility fosters improved mobility, autonomy, and household authority for rural women in Bangladesh.

Resumption of services

In 2003, the Bangladesh Ministry of Health reinstated the doorstep delivery of contraceptives. Phillips believes, however, that program managers should not simply resume the former approach to delivering family planning services to the home. This program, as it had been practiced for decades, likely met only a limited number of needs of the women it served. The services provided, for example, did not include general health care for adults and children.

To more fully meet the needs of clients and make the program as successful as it can be, researchers should conduct in-depth interviews and focus groups with clients and then design programs based on the needs that are revealed. "These new programs should be tested and adjusted to local conditions before large-scale operations are implemented," Phillips states. "Planners should base the design of the program on sound scientific evidence that the strategies pursued are appropriate for the setting," he concludes. ■

SOURCE

Phillips, James F. and Mian Bazle Hossain. 2003. "The impact of household delivery of family planning services on women's status in Bangladesh," *International Family Planning Perspectives* 29(3): 138–145.

OUTSIDE FUNDING

United States Agency for International Development

Reducing C-Sections May Require Multifaceted Approach

Latin America has some of the highest rates of cesarean section in the world, involving 25–30 percent of all deliveries. The World Health Organization recommends a safe target rate for c-sections of 15 percent. Researchers with the Latin American Caesarean Section Study Group, including Population Council regional director Ana Langer, investigated whether instituting mandatory second opinions in hospital obstetric wards would reduce the rate of unnecessary cesarean sections. A similar intervention on a smaller scale in Ecuador had resulted in an 18.5 percent reduction in c-sections.

Consequences of c-sections

As compared to vaginal deliveries, cesarean section deliveries are associated with increased maternal death, injury, and infection. In some cases, scheduled cesarean sections can result in babies being delivered prematurely, with undeveloped lungs. Cesarean deliveries are also more costly than vaginal deliveries and require longer hospital stays.

The Latin American Caesarean Section Study Group conducted a trial between October 1998 and June 2000. The study involved 36 hospitals (18 in Argentina, eight in Brazil, four in Cuba, two in Guatemala, and four in Mexico) and nearly 150,000 women. The hospitals were paired off and assigned randomly to experimental and control groups. One of the hospitals closed during the study, hence the hospital it was matched with was excluded from the trial. At all hospitals the researchers collected baseline data on the rate of c-sections for six months. Then, at the experimental hospitals, obstetricians and other staff underwent training for one month to prepare for the intervention. Finally, the investigators observed the outcome of the intervention for six months.

At the experimental hospitals a policy of mandatory second opinions was instituted for all elective and other nonemergency cesarean sections. Physicians often suggest that women get elective cesarean sections if they have undergone a c-section for a previous pregnancy. C-sections are also proposed when labor

progresses slowly or when there is evidence of fetal distress. Emergency c-sections, such as those involving maternal hemorrhage, umbilical cord prolapse, or uterine rupture, required no second opinion because delaying surgery might endanger the mother or infant. At the control hospitals the standard of care remained unchanged.

The researchers assessed whether the intervention would be effective under routine conditions. Therefore, strategies to improve compli-

“There are no easy answers about what strategies will effectively reduce the rate of c-section.”

ance with the intervention were left to hospital coordinators. In the end, second opinions were obtained for 88 percent of eligible c-sections.

Small reductions

The second-opinion policy was associated with a 7.3 percent reduction in the rates of cesarean section, a small but statistically significant decline. The researchers' analysis revealed that the decrease was seen mostly in the case of unplanned cesareans, usually those suggested for failure of labor to progress and for possible fetal distress. Here the reduction was 12.6 percent. The intervention and control hospitals were not perfectly matched. The baseline findings revealed that experimental hospitals had a larger proportion of women expecting their first child. First births are more likely than later births to be problematic. The women at the experimental hospitals were also more likely to have excessively heavy babies, which may be harder to deliver. Adjusting for

these differences further reduced the rate of cesarean sections.

Although the decline in c-section was statistically significant, it was not large enough to justify a change in current protocol. Instituting such a change in procedure would require a substantial effort. The cost of implementing the intervention on a large scale would potentially exceed the savings gained by avoiding a small number of c-sections.

“There are no easy answers about what strategies will effectively reduce the rate of c-section,” asserts Langer. “My hunch is that a multifaceted approach is likely needed.”

Langer suggests three potential targets for interventions to reduce the rate of c-sections: the medical system, women and families, and the culture. Educating senior physicians and medical school professors in evidence-based medicine will make them less likely to recommend c-sections in cases when it may not be necessary. These physicians can tutor younger doctors. Educating and empowering women and other family members about the risks and benefits of cesarean sections will make them better advocates for their own care. Finally, tackling the perception of c-section as a status symbol and addressing insurance policies that favor c-section will help to give proper prominence to vaginal delivery and its benefits.

A similarly comprehensive campaign, the UNICEF/World Health Organization's Baby Friendly Hospital Initiative, successfully increased the rate of breastfeeding in the 1990s. ■

SOURCE

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OUTSIDE FUNDING

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Lessons from Introducing Postabortion Care in Egypt

Complications from unsafe or incomplete abortion include hemorrhage, severe infection, and shock. These conditions can arise with either induced or spontaneous abortion, also known as miscarriage, and can kill a woman if not treated promptly. Population Council research has shown that women who experience complications from miscarriage or unsafe abortion are among the most neglected of all reproductive health care patients.

In the early 1990s, Population Council staff in Egypt began discussions with government representatives about a program of work to improve postabortion care in that country. This initiative eventually developed from research investigations to program implementation. "Lessons learned in this endeavor offer insights into working with sensitive topics like abortion and female genital cutting," says Nahla Abdel-Tawab, Population Council public health researcher in Cairo.

Egypt's postabortion care initiative

Egypt's abortion policy allows the practice only when a woman's life is in danger. This policy can have an unfortunate impact on how care-givers treat postabortion complications. Population Council researchers made clear from the start that the rationale for studying this topic was to improve health care, not to make induced abortion more accessible. "We always spoke of postabortion care as a neglected dimension of medicine and emphasized the need for protecting those women against unplanned pregnancy," explains Laila Nawar, former Population Council regional advisor based in Cairo, currently a Council consultant and research advisor at the Cairo Demographic Center. "The trust we were able to build with program managers and policymakers was instrumental to the success of our initiative."

The body of research conducted on postabortion complications over the past decade has raised awareness of the problem among public health officials in Egypt. For example, the initial pilot study showed that changes in

the clinical management of postabortion patients and a brief, intensive training program for health-care providers could lead to significant improvements in patient care. An assessment of the postabortion caseload showed that one in five obstetric hospital admissions in Egypt is for emergency treatment of incomplete abortion. And a study of psychosocial stress related to postabortion care showed that women who suffer spontaneous abortion are largely ignorant of the reasons for the miscarriage.

Council researchers used targeted briefings to reach appropriate government officials and donor agencies with the results of their investigations, and government officials supported continued work on postabortion services.

The Council worked with Ipas, a nonprofit women's health organization, to develop a strategy statement to guide the growth of Egypt's postabortion care program. The pilot study was scaled up in ten hospitals and in the process provided training for some of Egypt's leading obstetrician/gynecologists in the proper care of women who suffer complications from miscarriage or unsafe abortion.

During this phase, the program was largely affiliated with Egypt's family planning program. Eventually, however, the postabortion care initiative was folded into Egypt's Essential Obstetric Care Program. Significantly, the term "postabortion care" was dropped as the protocols appear largely within guidelines for managing bleeding in pregnancy, which is a primary complication of incomplete abortion. Moreover, the protocols do not emphasize the inclusion of family planning counseling. By integrating these protocols within the national safe motherhood program, the initiative graduated from a research activity to a large-scale program, supported by the government and provided as a routine emergency medical service to women in Egypt's hospitals.

The current situation

Recently, the USAID-funded Tahseen/Catalyst project initiated a training program on

improved postabortion care, including family planning counseling, for providers in several public hospitals and in curative care settings.

One stumbling block to the program continues to be a shortage of equipment, known as manual vacuum aspiration (MVA) instruments, for treating incomplete abortion. During MVA a health-care provider inserts a thin, syringe-like instrument into the uterus through the cervix and uses gentle suction to empty it. The Egyptian Ministry of Health and Population has rejected three applications for the importation of MVA instruments. "This response can be attributed to the review board's reluctance to approve any technology that is even indirectly associated with induced abortion," elaborates Abdel-Tawab.

Because MVA instruments are difficult to obtain in the private sector, many physicians continue to use dilation and curettage rather than the less complicated and less painful MVA procedure to treat incomplete abortion.

"We are hopeful that the expansion efforts and the continuous training activities for the Ministry of Health and Population will build a constituency of providers who are competent in managing complications of incomplete abortion, who are conversant with the technique of MVA, and who will inform regulatory bodies of the importance of approving MVA instruments to save the lives of thousands of Egyptian women," says Abdel-Tawab. ■

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Potential Long-Acting Male Contraceptive Studied

Scientists know much more about the basic workings of the female reproductive system than about the male reproductive system. Thus, while for more than 40 years birth control pills and intrauterine devices have been providing highly effective, practical, and acceptable long-term contraception for women, the development of reversible, long-term male contraception has confounded researchers. Much of the work done at the Population Council's Center for Biomedical Research is geared toward gaining a more complete understanding of male reproductive physiology and developing new male contraceptives. Recent research conducted by Council biomedical researchers and the Council's International Committee for Contraception Research (ICCR) confirms the promise of MENT®, the Council's trademarked synthetic androgen, as a component of a male contraceptive method.

The ICCR, established by the Population Council in 1970, is a network of distinguished scientists and clinical investigators who conduct clinical trials to test the safety, efficacy, and acceptability of Council-developed products.

MENT

Several potential male contraceptive methods that rely on MENT (7 α -methyl-19-nortestosterone) are under development at the Population Council. Council researchers identified MENT, a testosterone-like hormone, as a suitable contraceptive candidate because it suppresses the secretion of hormones that stimulate the testis and control reproductive activity. The inhibition of these hormones—including luteinizing hormone (LH), follicle-stimulating hormone (FSH), and testosterone—reduces sperm production. At the same time, MENT replaces testosterone to maintain primary and secondary sex characteristics. An added advantage of MENT is that it does not overstimulate the prostate, as does testosterone. It also maintains libido, an important function of testosterone. MENT is

ten times as potent as testosterone. Thus, the doses required are lower than those found in commercially available testosterone preparations, making it feasible to administer the compound via long-acting subdermal implants.

The Council is investigating the contraceptive potential of MENT acetate (MENT Ac), which the body breaks down into active MENT. Thirty-five volunteers were recruited in three clinics, one each in Germany, Chile, and the Dominican Republic. These men were randomly assigned to one of three doses of MENT: one implant (12 men), two implants

“MENT Ac can inhibit the production of sperm over a prolonged period.”

(11 men), and four implants (12 men). The implants were inserted on the inside of the upper arm. Two men dropped out of the study, one for personal reasons and the other because of high blood pressure. The man's blood pressure returned to normal within one month of implant removal, after the patient quit smoking and went on a diet. “High blood pressure has not emerged as a problem in larger studies of MENT,” states Population Council scientist Irving Sivin. “We believe that the condition was unrelated to MENT and probably arose due to the patient's smoking and eating habits.”

The treatment was initially designed to last six months. However, on the basis of early positive findings, the length of the study was extended in two clinics to nine months for the two-implant group and to 12 months for the four-implant group.

Dose-dependent response

The researchers found that the greater the number of implants a man had, the higher the level of MENT in his blood and the lower the levels of testosterone, LH, and FSH. In addition, the more implants a man had, the greater his reduction in sperm production. In eight of the 11 remaining men with four implants, sperm counts rapidly dipped to zero. This condition lasted in many subjects for several months until the implants were removed. After removal, an interval of about three months was required for sperm counts to return to normal in these men. Furthermore, participants at every dosage level reported no significant change during or after treatment in four measures of sexual performance.

“This study demonstrates that MENT Ac, when administered in a sustained-release fashion via subdermal implants, can inhibit the production of sperm over a prolonged period,” says Narender Kumar, Population Council biomedical researcher. “MENT definitely has the potential to be used as a male contraceptive.” Population Council scientists are studying the effect of combining MENT Ac implants with a synthetic progestin hormone. A number of studies have shown greater suppression of sperm production when the androgen is combined with a progestin. Long-term toxicology studies of MENT are also ongoing. ■

SOURCE

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give adolescents sexual and reproductive health information and referrals for services. These counselors, known as Friends of Youth, received a month of training on community, family, and individual values; adolescent development; sexuality; gender roles; relationships; pregnancy; sexually transmitted infections; HIV/AIDS; harmful traditional practices, such as female genital cutting; substance abuse; planning for the future; children's rights; and advocacy.

The Friends of Youth gave adolescents in need of health services coupons that entitled them to visit participating providers, mostly in the private sector. These services were subsidized by the providers and the Family Planning Association of Kenya.

Before they conducted educational activities, the 25 counselors went house to house in their assigned areas to introduce themselves and learn about local needs. After this informal community assessment, counselors conducted a range of activities with young people, including group discussions, role-playing exercises, drama activities, and lectures. Counselors also worked with parents and teachers in the area. In all, counselors made more than 40,000 contacts with young people and 5,800 contacts with parents during the three years of the project.

Prior to the intervention, the researchers interviewed 1,544 unmarried young people in the project and control areas. Following the intervention, they interviewed 1,865 young people. By the end of the project, nearly half of

Nyeri parents were aware of the project, and 19 percent had attended sessions with a counselor; two-thirds of all young people aged 10–24 were aware of the program, and one-third had had contact with a counselor.

Significant change

The investigation showed that during the course of the intervention, the proportion of young people reporting healthy behavior increased in the project area and decreased in the control area (see table). The percentage of young people in the project area who said that they had had sex for the first time in the previous three years dropped between 1997 and 2001, as did the number of young people who said that they had had three or more sexual partners during the previous three years. There was also an increase in the percentage of males and females who reported that they used condoms the last time they had sex, abstained from sex for the last six months, and discussed a sexual or reproductive health topic with a parent or other adult. In contrast, in the control area males fared worse in 2001 than they did in 1997 on four of the six indicators measured and females fared worse on five of the six indicators.

The experiment has demonstrated the importance of learning about community needs and exploring local culture. "Despite the incredible diversity in Africa, policymakers have stuck with a small set of intervention models," says

Percentage of adolescents reporting selected reproductive health behaviors, by sex and site, 1997 and 2001

Behavior	Males				Females			
	Project		Control		Project		Control	
	1997	2001	1997	2001	1997	2001	1997	2001
Initiated sex	34	24	30	33	24	21	25	21
Abstained from sex for last 6 months	34	38	26	30	40	53	39	26
Used condom at last sex	39	45	41	16	22	32	28	25
Had ≥3 sex partners in the last 3 years	29	24	38	30	14	5	13	30
Discussed reproductive health with parent	10	17	33	32	26	37	39	19
Discussed reproductive health with other adult	39	47	39	31	49	57	54	26

Source: *International Family Planning Perspectives* 30(2): 58–67, Table 2.

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Population Council public health scientist Annabel S. Erulkar, lead researcher of the study. "The Nyeri Youth Health Project adapted the traditional Kikuyu system of *atiri*, or respected adult counselor, to give young people information and support." This intervention shows that programs adapted from local cultures can help improve the reproductive health status of young people in sub-Saharan Africa. The researchers have received a grant to scale up the intervention throughout the rest of Central Province and in slum areas of Nairobi. ■

SOURCE

Erulkar, Annabel S., Linus I.A. Ettyang, Charles Onoka, Fredrick K. Nyagah, and Alex Muyonga. 2004. "Behavior change evaluation of a culturally consistent reproductive health program for young Kenyans." *International Family Planning Perspectives* 30(2): 58–67.

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